ALABAMA DEPARTMENT OF TRANSPORTATION

Bridge Bureau1409 Coliseum Blvd., Montgomery, AL 36110
Phone: (334) 242-6001 Fax: (334)353-6502
Internet: http://www.dot.state.al.us

Robert Bentley
Governor

John R. Cooper
Transportation Director

DATE: November 25, 2013

TO: Mr. William Adams, P.E.
State Design Engineer

FROM: John F. Black, P.E.
Bridge Engineer

SUBJECT: Design Flood Frequencies for Bridge Openings and Scour Evaluations

Attached is Guideline for Operations 3-39, "Design Flood Frequencies for Bridge Openings and Scour Evaluations". GFO 3-39 has been approved by Chief Engineer, Ronald Baldwin, and Director John Cooper.

The Bridge Bureau is requesting that your office include this GFO in the Department's manual of GFO's, notify other Departmental personnel of its existence, and make it available for viewing on the ALDOT intranet and internet web sites.

By copy of this letter I am requesting that Mr. Ed Austin, Innovative Programs Engineer, amend or supplement the Memorandum of Understanding between The Federal Highway Administration and the Department of Transportation dated October 5, 2012 (Project Development Guidelines for the Alabama Transportation Rehabilitation and Improvement Program) to incorporate this approved Guideline for Operations.

Thanks for your assistance. Please let me know if there are any questions.

/jfb

c: Mr. Tom Flournoy, PE
Mr. Ed Phillips, PE
Mr. Ed Austin, PE
Mr. Lewis Harden, PE
Bridge Design Section Supervisors

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Robert Bentley
Governor

John R. Cooper
Transportation Director

DATE: October 4, 2013

TO: Mr. Ronald L. Baldwin, P.E.
Chief Engineer

FROM: John F. Black, P.E.
Bridge Engineer

SUBJECT: Proposed Guideline for Operations 3-39
Design Flood Frequencies for Bridge Openings and Scour Evaluations

Attached for your review, consideration and approval is proposed guidance for promoting consistency in selecting design flood frequencies to be used in designing bridge openings and computations of scour.

Current policy is to use the 50 year event (Q50) for structures on the Interstate and State Route system. The design flood for scour for both Interstate and State Route structures is the 100 year event (Q100) and the extreme event flood is the 500 year event (Q500). The proposed GFO recommendations does not alter our current policy for Interstate structures but does allow the 200 year event (Q200) to be used in computing scour for the extreme flood. Use of the 200 year event for extreme flood in computing scour is permissible per the 5th Edition of FHWA Hydraulic Engineering Circular 18, Evaluating Scour at Bridges.

Current policy is to use the 25 year event (Q25) for structures on the County and City Route system. The design flood for scour for both County and City Route structures is the 100 year event (Q100) and the extreme event flood is the 500 year event (Q500). The proposed GFO recommended changes will permit the various County and City Engineers to assist our efforts in determining the flood frequencies to be used in designing bridge openings and computing scour. We are proposing a risk based approach to designing for bridge opening and scour based on Average Daily Traffic.

If the proposed GFO is approved, the Department will need to amend the current MOU between ALDOT and FHWA for design of structures being replaced under ATRIP. The proposed GFO has been discussed with FHWA and has their concurrence.

Bridge Bureau will be happy to meet with you if necessary to further explain the need for the Guideline for Operations.

Thanks for your consideration of this request.

/jfb

STATE OF ALABAMA

DEPARTMENT OF TRANSPORTATION

GUIDELINES FOR OPERATION

SUBJECT: DESIGN FLOOD FREQUENCIES FOR BRIDGE OPENINGS AND SCOUR EVALUATIONS

The design flood frequencies given in the table below are standard criteria for the design of bridge openings and scour evaluations. The design flood frequency may be based on a smaller or larger flood frequency (less or greater than the Q25 or Q50) if site conditions warrant a lower or higher standard. Selection of the design flood frequency includes consideration of construction cost, possible damages to the highway and surrounding property caused by flooding, potential hazard and inconveniences to the traveling public, alternate routes, emergency and evacuation routes, and economic or budgetary constraints.

Design Flood Frequencies for Bridge Openings and Scour Evaluations

TYPE OF ROAD		FLOOD FREQUENCY FOR DESIGNING BRIDGE OPENING [1]	FLOOD FREQEENCY FOR EVALUATING BRIDGE SCOUR [2]	
			Design Flood	Check Flood
Interstate		Q50	Q100	Q500
State Routes		Q50	Q100	Q200
Collector - County/Municipality [3]	ADT [4]			
	1-99	Q1.5 to Q25 [5]	Q50	Q100
	100-399	Q10 to Q25 [5]	Q50	Q100
	400-	Q25	Q50	Q100
Local - County/Municipality [3]	ADT [4]			
	1-99	Q1.5 to Q25 [5]	Q50	Q100
	100-399	Q10 to Q25 [5]	Q50	Q100
	400-	Q25	Q50	Q100

Note 1: Design flood equal to or greater than the 25-year flood will require at least 2 feet of freeboard when setting low chord or minimum finish grade elevation of Bridge. Freeboard requirement does not apply to bridge culverts.

Note 2: In case of road overtopping less than Q-Design, use worst case scenario for evaluating scour.

Note 3: If County/Municipality requests a bridge opening design using a Q50, the design flood for evaluating bridge scour should be Q100 and Q200 for the check flood or the worst case scenario if road is overtopped.

Note 4: Average Daily Traffic – Projected 20-year volume.

Note 5: Design flood should be commensurate with the type of road and risk the County/Municipality desires.

RECOMMENDED FOR APPROVAL: John F. Black
STATE BRIDGE ENGINEER

APPROVAL: Ronald Z. Baldwin
CHIEF ENGINEER

APPROVAL: John F. Cooper
TRANSPORTATION DIRECTOR

11/18/13
DATE